ROTAXYS360

Original Operating Manual 1.00 – July 2015

rotAXYS 360

Hardware Manual

cetoni®

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1. Overviews and Indexes

1.1. Content

1. Overviews and Indexes 5
1.1. Content 5
1.2. Revision History 7
2. Introduction 8
2.1. Preface 8
2.2. Symbols and Keywords 8
3. Basic Information 9
3.1. Preface 9
3.2. Intended Use 9
3.2.1. General Description of the Machine 9
3.2.2. Appropriate Use 9
3.2.3. Reasonably foreseeable Misuse 9
3.2.4. Safety Measures 10
3.2.5. Measures for safe Operation 11
3.2.6. Safety Facilities on the Device 12
3.2.7. Device Condition 12
3.3. Warranty and Liability 12
3.4. Scope of Delivery 14
3.6. Optional Accessories 15
4. Technical Data 16
4.1. Performance Data 16
4.2. Dimensional Drawing 17
4.3. Working Area 18
4.4. Dimensional Drawing of Work Table Mounting Holes 19
5. Transport and Storage 20

5.1. Transport 20
5.2. Storage 20

6. Initial Operation 21
6.1. Setting up the Device 21
6.3. Connecting the Device 23
6.3.1. Operation as a standalone device 23
6.3.3. Operation with neMESYS or Qmix Devices 24

7. Hardware Operation 26
7.1. Introduction 26
7.2. Installation of the optional Sample Table 26
7.3. Installation / Exchange of the Tool Holder 27
7.4. Connecting a Hose 28
7.4.1. Attaching a Hose to the Tool Holder 28
7.4.2. Attaching a Hose to the Pivoting Boom 29
7.4.3. Attaching a Hose to the Sample Table 29

8. Maintenance and Care 32
8.1. Introduction 32
8.2. Troubleshooting 32

9. Disposal 33

1.2. Revision History

Rev	Date	Modification
1.00	24.06.2015	Creation of rotAXYS Manual

2. Introduction

2.1. Preface

Thank you for purchasing a cetoni product. With this manual we would like to support you in using the device. For additional questions or comments please feel free to contact us directly.

2.2. Symbols and Keywords

This manual uses the following symbols, intended to help you navigate the document:

TIP

User tips and useful information to simplify the use of the software.

IMPORTANT

Important information and additional, particularly useful information. This symbol does not refer to dangerous or hazardous situations.

CAUTION

This symbol signifies a potentially hazardous situation. Failing to avoid it may cause damage to the product or its environment.

WARNING

This symbol signifies a potentially dangerous situation. Failing to avoid it may cause light or insignificant injury or material damage.

3. Basic Information

3.1. Preface

Thank you for purchasing a cetoni product. With this manual we would like to support you in using the device. For additional questions or comments please feel free to contact us directly.

Please read this manual carefully before operating the device. We wish you the best of success in your work with the rotAXYS positioning system.

3.2. Intended Use

3.2.1. General Description of the Machine

rotAXYS360 is a positioning system. It can position lightweight items, such as cannulas or hoses in a circular area with a radius of approximately 200 mm. It can also lift items up to approximately 96 mm.

3.2.2. Appropriate Use

The rotAXYS360 positioning system is intended to position small, lightweight items, such as hoses or cannulas in a circular area with a radius of approximately 200 mm. Therefore, it is suitable for putting down, picking up and observing samples in titer plates. The device is typically used in lab-like environments.

3.2.3. Reasonably foreseeable Misuse

Using the device for applications other than the intended ones may lead to dangerous situations and must be avoided.

WARNING

The device must not be used as a medical product or for medical purposes.

3.2.4. Safety Measures

Operator safety and failure-free operation of the device can only be guaranteed when using original equipment parts. Only original accessories may be used. Warranty claims are void if damage was caused by using third-party equipment or third-party material.

The device was developed and designed in such way as to largely rule out dangers, if used properly. Nevertheless, you should observe the following safety measures to rule out any residual danger.

- cetoni GmbH would like to point out the operator's responsibilities when using the device. The laws and regulations relevant to using this device must be observed. In the interest of a safe work process the operator and user of the device is responsible for observing all relevant laws and regulations.

- The device must not be used as a medical product or for medical purposes.

- Before each operation of the device the user has to ensure that the device is functioning safely and is in proper condition.

- The user must be familiar with the operation of the device and the software.

- Before starting operation, the device and wiring must be checked for damage. Damaged wires and plugs must be replaced immediately.

- Cables must be routed in such way as to rule out any trip hazards.

- Do not touch moving parts on the device during operation. There is a risk of crushing.

- Make sure to wear safety goggles during installation work on the device or when you work with corrosive, hot or otherwise dangerous substances.

WARNING

The device is not fitted with an explosion protection system and is therefore not suitable for working with flammable or explosive materials.

IMPORTANT

During operation of the device all relevant laws and regulations applicable at the operating location must be observed. In the interest of safe work processes the operator and user is responsible for observing all relevant rules and regulations.

3.2.5. Measures for safe Operation

3.2.5.1 Electromagnetic Emissions

The device is designed for usage in any facility, including living spaces and facilities directly connected to a public supply network that also supplies buildings used for residential purposes.

3.2.5.2 ESD Discharge

Floors should be wood or concrete or covered with ceramic tiles. If floors are covered with synthetic material, relative air humidity must be at least 30%.

3.2.5.3 Electrical Disturbances

Supply voltage quality should be equal to a typical business or hospital environment.

3.2.5.4 Magnetic Disturbances

Power lines, including those of other devices, should not be placed near the device or its cables. Portable and mobile two-way radios should be kept at the minimum safe distance from the device and its wiring.

3.2.6. Safety Facilities on the Device

In cases of emergency the device can be deactivated at any time using the power switch on the base module (toggle switch on the side of the device), without causing any damage to the device itself. If the device is operated without the base module, you can simply pull the plug out of the power supply socket.

3.2.7. Device Condition

Despite flawless workmanship, the device may be damaged during operation. Therefore, you should visually inspect the device components mentioned before each use. Pay particular attention to crushed cables and deformed plugs. If you find any damage, please refrain from using the device and contact cetoni GmbH immediately. We will repair your device as soon as possible. Never attempt to repair the device yourself.

3.3. Warranty and Liability

The device has left our facilities in perfect condition and may only be opened by cetoni GmbH. If the device is opened by an unauthorized person, all warranty and liability claims shall be void, in particular those referring to personal injury.

The warranty period is 1 year from the day of delivery. Any work done on the device within this period shall not extend or renew the warranty.

cetoni GmbH assumes responsibility for its devices with respect to safety, reliability and function only if installation, readjustment, changes, extensions and repairs are done by cetoni GmbH or an authorized party, and if the device is used in accordance with the user manual.

The rotAXYS360 positioning system complies with the applicable safety rules and standards. cetoni GmbH reserves all property rights for the relevant wiring, processes, names, software and devices.

3.4. Scope of Delivery

The following items should have been supplied:

rotAXYS360 axis system

Interconnect cable for the connection to the Qmix base module

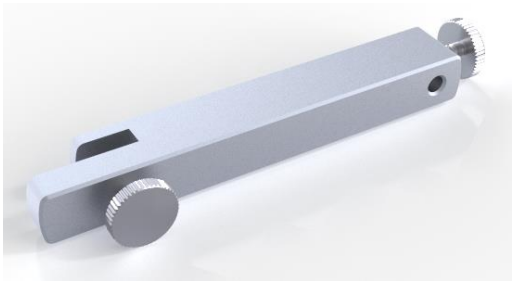
QmixELEMENTS
cetoni
cetoni GmbH
Am Wiesenring 6
07554 Korbussen
info@cetoni.de
Please note: Before you connect your device you should install the software and drivers
For the latest software versions please visit our homepage: www.cetoni.de

CD-ROM QmixElements, including:

- Device driver for USB interface
- QmixElements software
- Qmix SDK
- neMAXYS device configuration

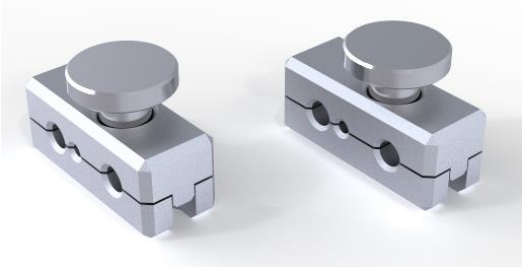
3.6. Optional Accessories

Sample table with holders for 6 well plates and 6 beakers



Hose arm holder

Hose arm



2 x hose clamps

4. Technical Data

4.1. Performance Data

Environment	
Operating temperature	-10°C to 45°C
Storage temperature	-10°C to 45°C
Operating air humidity	20% to 80%, non-condensing
Storage air humidity	20% to 80%, non-condensing
Acoustic power level	<70 db(A)

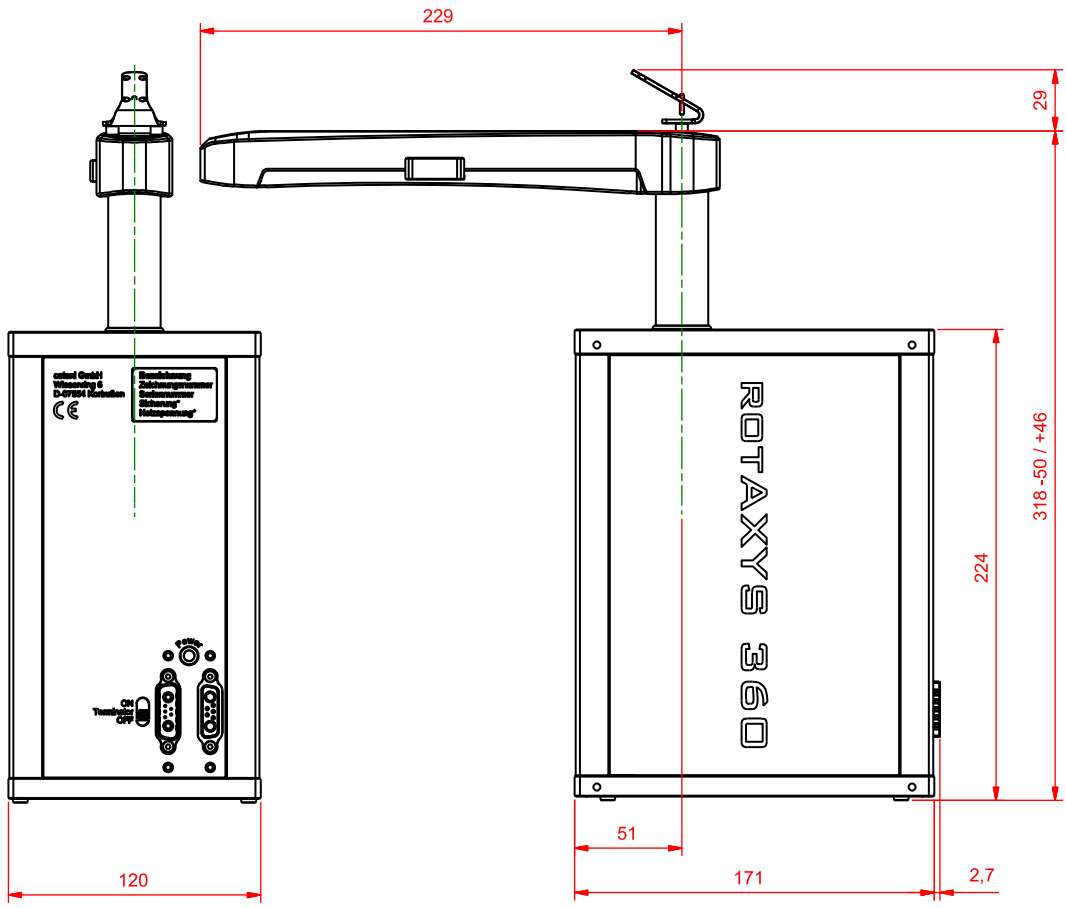
Mechanical Data	
Weight	6 kg excluding table
Dimensions (L x W x H)	226 (180) x 110 x 175 mm
Stroke	96 mm

Electrical Data	
Power supply	24 VDC ± 10%
Peak current draw	2 A

Positioning Unit		
Motors		Stepper motors
Position control		Open loop
Lifting axis	Travel rangle	93 mm
	Max. speed	73 mm/s
	Repeatability	0,2 mm
Turning axis	Travel rangle	360°
	Max. speed	292°/s
	Repeatability	0,13° = 0,5 mm at radius 204 mm

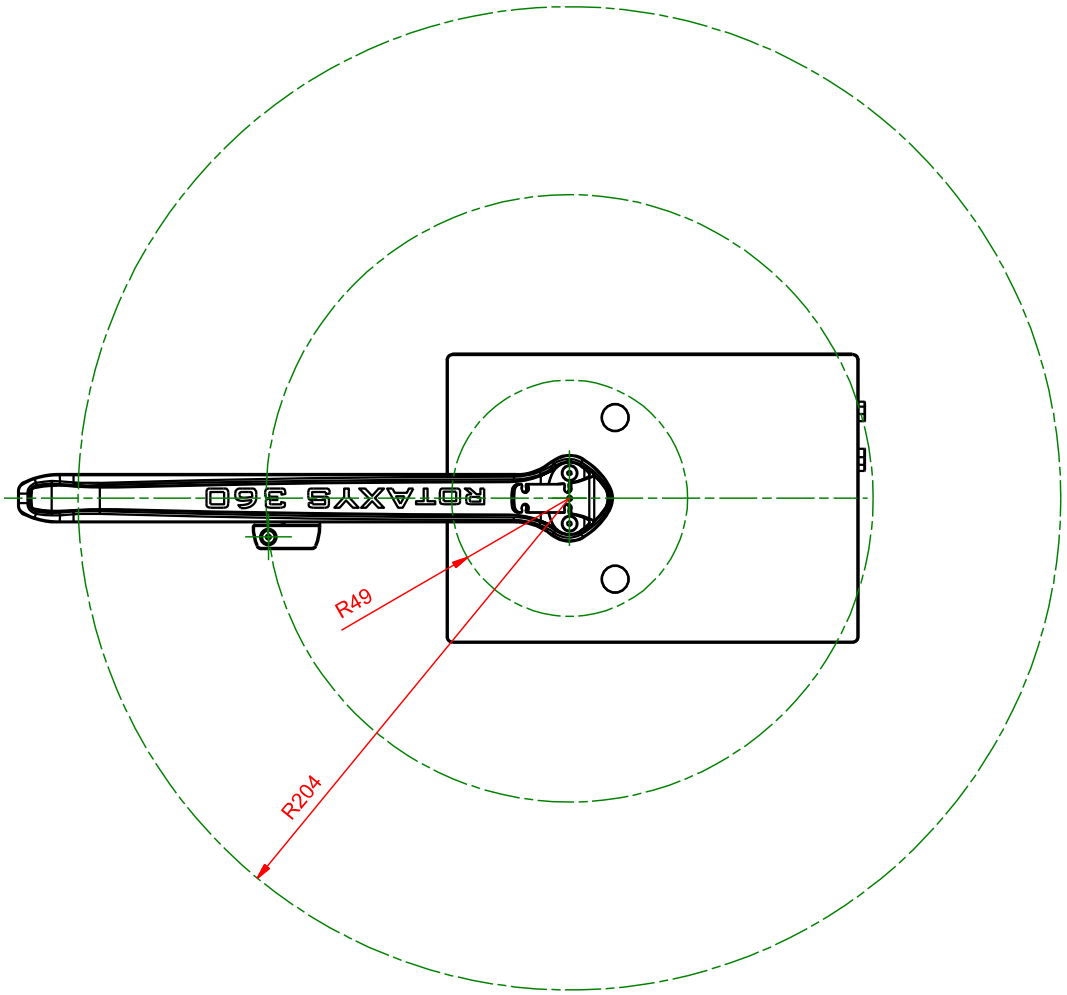
Radial axis	Travel rangle	155 mm
	Max. speed	175 mm/s
	Repeatability	0,5 mm

4.2. Dimensional Drawing



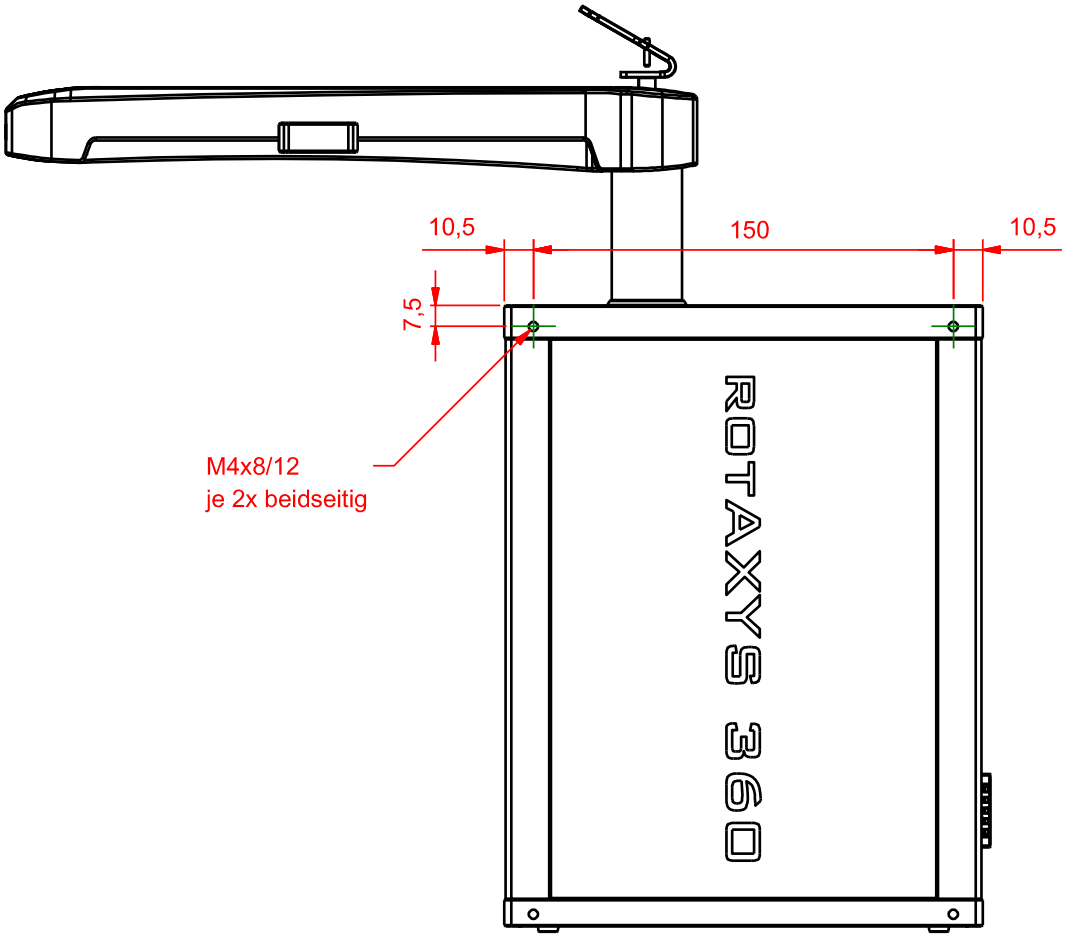
4.3. Working Area

The following drawing shows the working area of the rotAXYS360 positioning system. With the standard tool holder it is possible to reach any point between the minimum radius of 49 mm and the maximum radius of 204 mm.



4.4. Dimensional Drawing of Work Table Mounting Holes

The rotAXYS360 device features eight M4 threaded holes to attach a worktable or to attach the device to a larger system.



5. Transport and Storage

5.1. Transport

Always use the original package for transporting and shipping the device.

WARNING

There is a risk if injury and material damage due to falling objects. Never carry the device by the pivoting arm. Instead always hold the housing itself.

5.2. Storage

Please refer to the technical data sheet (section 4) for more information on operation and storage of the device.

6. Initial Operation

6.1. Setting up the Device

Place your rotAXYS360 positioning system on a level, horizontal surface, such as a table, base cabinet or equipment trolley. Make sure there is enough space for the pivoting boom to reach all required positions.

The electrical power connections are located at the back of the device. They are shown in the image below.

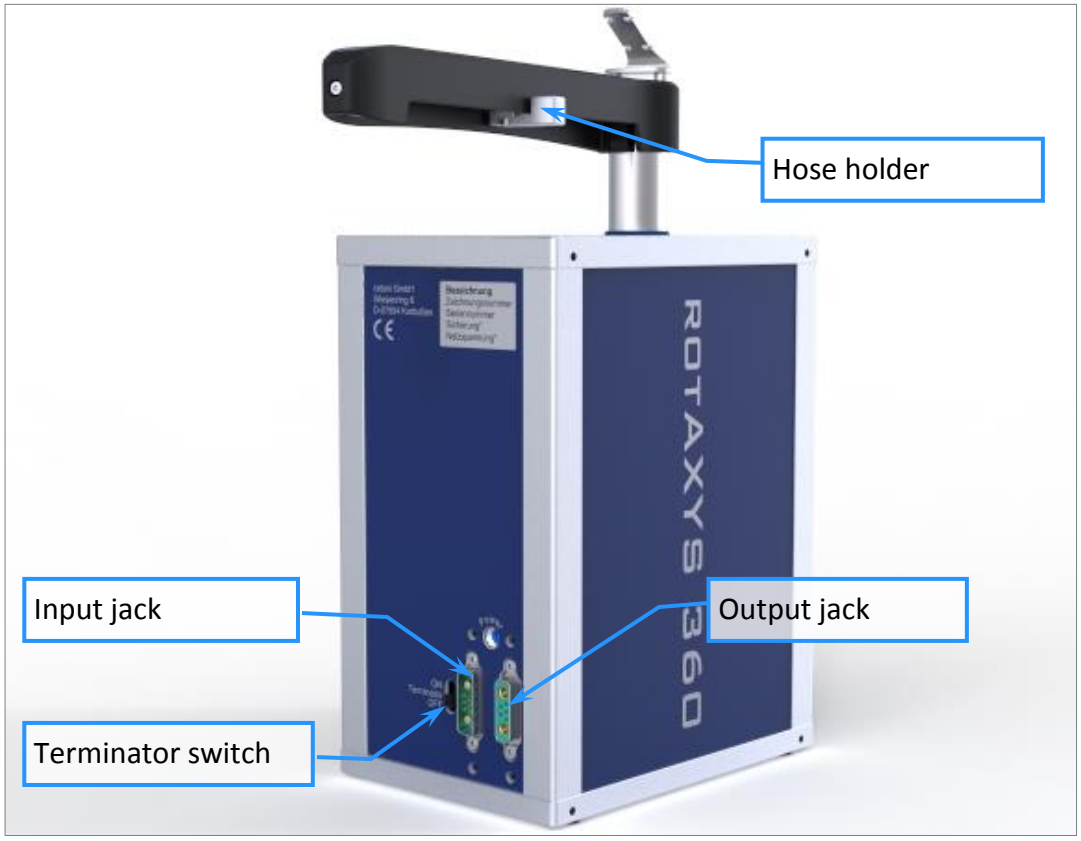


Figure 1 – Overview of device hardware

WARNING

There is a risk of injury due to damaged wires and plugs. Check the device and wires for damages before operation. Never operate the device with damaged wires or plugs. Only use the cables supplied with the device.

WARNING

There is a risk of stumbling due to connection cables. Makes sure to rule out such dangers when you install the cables.

IMPORTANT

Install the software and the device drivers before connecting the device to a PC.

6.3. Connecting the Device

6.3.1. Operation as a standalone device

(1) Connect the USB plug 1 of the USB-to-CAN adapter to a USB outlet on your PC.

(2) Connect the second socket of the adapter 2 to the associated interconnect cable 3 and connect the cable's input plug 4 to the back panel connector of the rotAXYS positioning system.

(3) Connect the cable ends 5 to a 24 Volt power supply (black = ground, red = 24 Volt).

(4) Switch the terminator switch to the "ON" position.

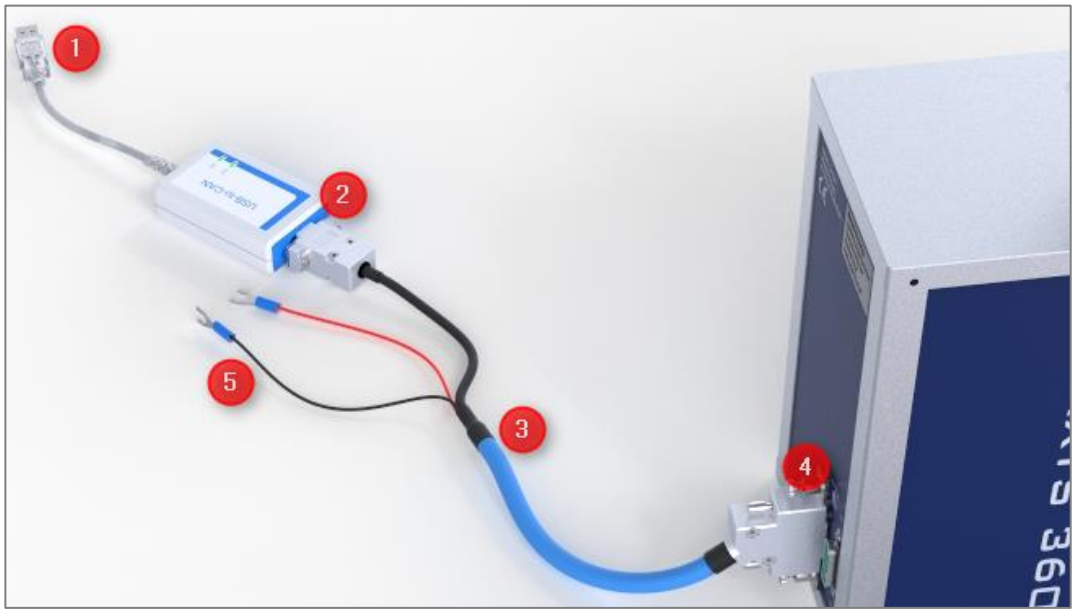


Figure 2 – Connection as a standalone device

6.3.3. Operation with neMESYS or Qmix Devices

(1) Connect the output socket 1 of the last module of your neMESYS or Qmix system using the associated interconnect cable 2 to the input plug 3 at the back panel of the rotAXYS360 positioning system.

(2) You can use the output socket 4 of the rotAXYS360 positioning system to connect additional devices using a second interconnect cable. In this case you have to turn the terminator switch to the “OFF” position.

(3) If you don’t connect any additional devices and the rotAXYS360 positioning system is the last device in your system, please turn the terminator switch to the “ON” position. This activates the bus termination resistor of the internal data bus.

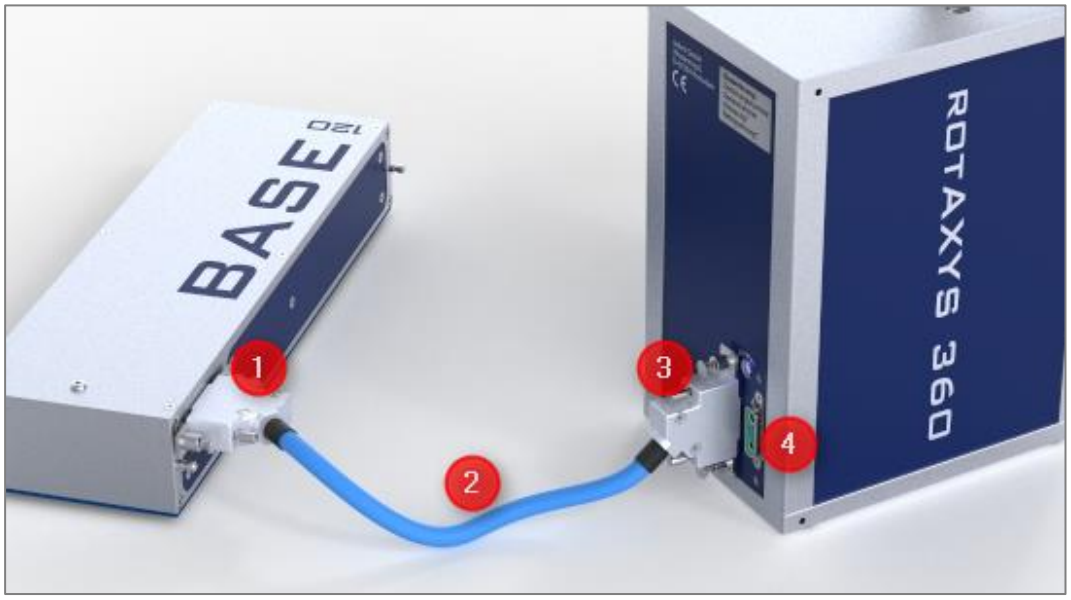


Figure 3 – Connection to a Qmix- / neMESYS system

WARNING

There is a risk of crushing due to moving parts. Never touch the device during operation.

WARNING

There is a risk of injury due to moving parts or pointed tools mounted to the tool holder. Do not approach moving parts during operation.

7. Hardware Operation

7.1. Introduction

In its standard configuration the rotAXYS360 positioning system is supplied with a table to accommodate 6 micro titer plates and 6 sample containers as well as a tool holder with a ¼“-28 UNF thread. The tool holder allows the installation of a hose or cannula without the necessity of using HPLC fittings. The following sections will demonstrate how to use this table and the tool holder.

7.2. Installation of the optional Sample Table

Place the sample table above the pivoting boom of the device as shown in the image below and fit the cover plate into the central opening of the sample table.

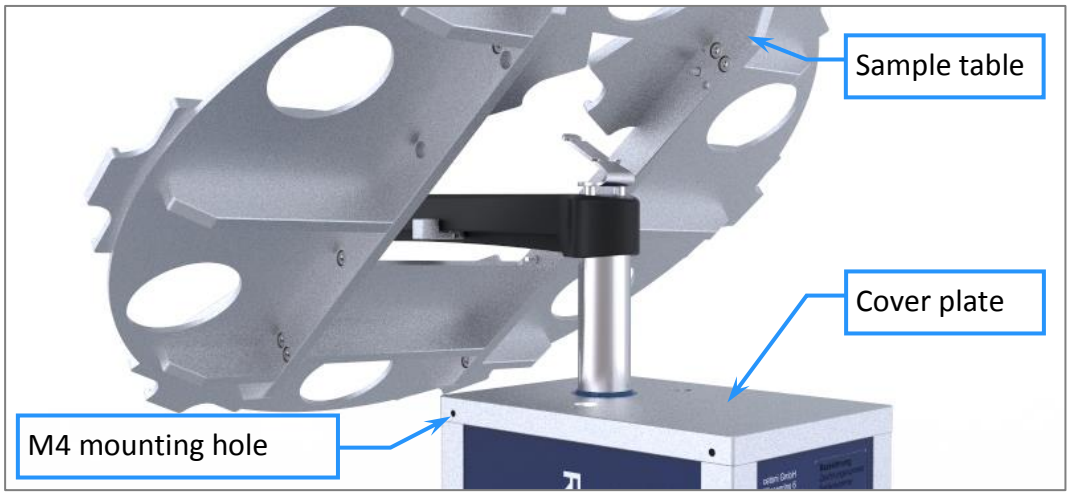


Figure 4 – Sample table installation

Now attach the sample table by inserting the four M4 bolts supplied into the mounting holes in the sides of the top cover plate.

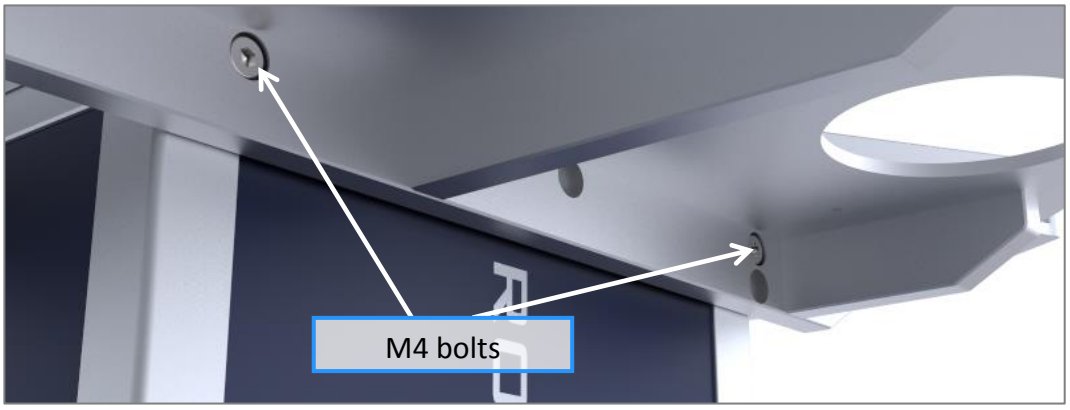


Figure 5 – Screw attachment of sample table

After the installation you can place sample containers such as well plates or beakers on the sample table.

Figure 6 - rotAXYS360 with sample table

7.3. Installation / Exchange of the Tool Holder

Remove the two bolts (marked in the image) on the underside of the pivoting boom using a 2mm Allen wrench. You can now remove and replace the tool holder. Attach the new tool holder by reinserting and tightening the bolts.

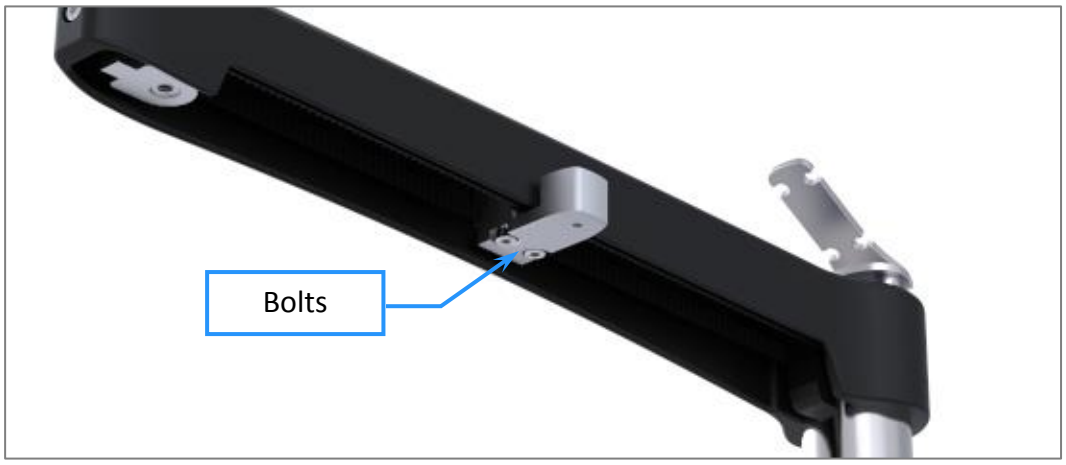


Figure 7 - Installation / Exchange of the Tool Holder

7.4. Connecting a Hose

7.4.1. Attaching a Hose to the Tool Holder

Depending on the fitting used you can attach hoses or cannulas of varying diameters to the tool holder of the rotAXYS360 positioning system.

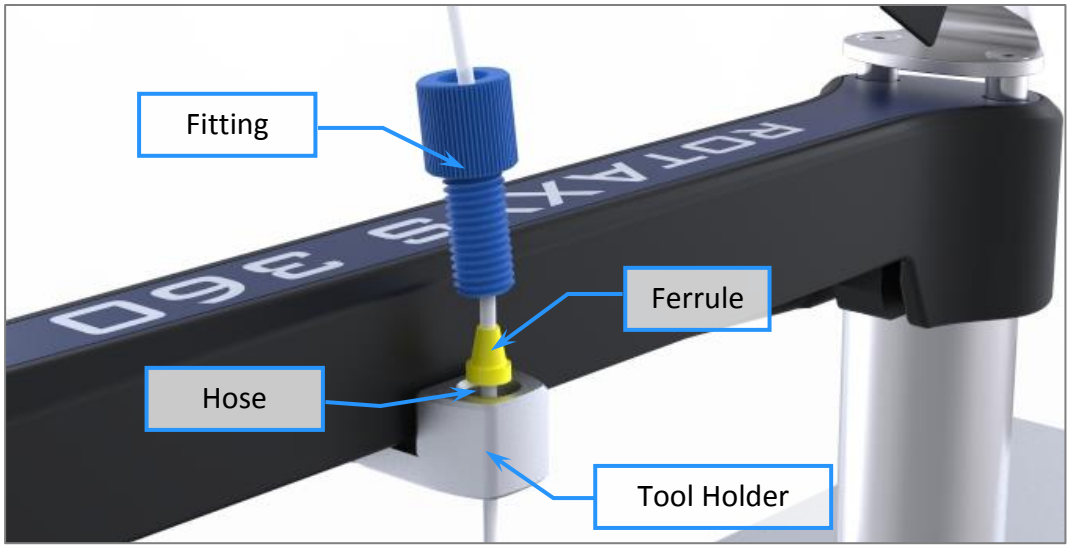


Figure 8 – Attaching a hose to the tool holder

Place the fitting and the ferrule over the hose and insert it into the hole of the tool holder. Adjust the length of the protruding hose tip to fit your application and lock the hose in position by tightening the fitting.

CAUTION

There is a risk of damaging the thread when connecting the hose.

Make sure the thread is straight when you screw in the fitting.

CAUTION

There is a risk of damaging the electronics of the device due to faulty fluidic connections.

Test the tightness of all fluidic connections on a regular basis every time you connect a new hose.

7.4.2. Attaching a Hose to the Pivoting Boom

Attach the hose to the holder on the pivoting boom using the rubber clip. Make sure there is a sufficient length of hose to allow movement across the entire work area.

Figure 9 – Attaching a hose to the boom

7.4.3. Attaching a Hose to the Sample Table

By using the supplied hose arm you can attach the hose to the sample table in such way that it doesn't protrude into the working area of the axis system.

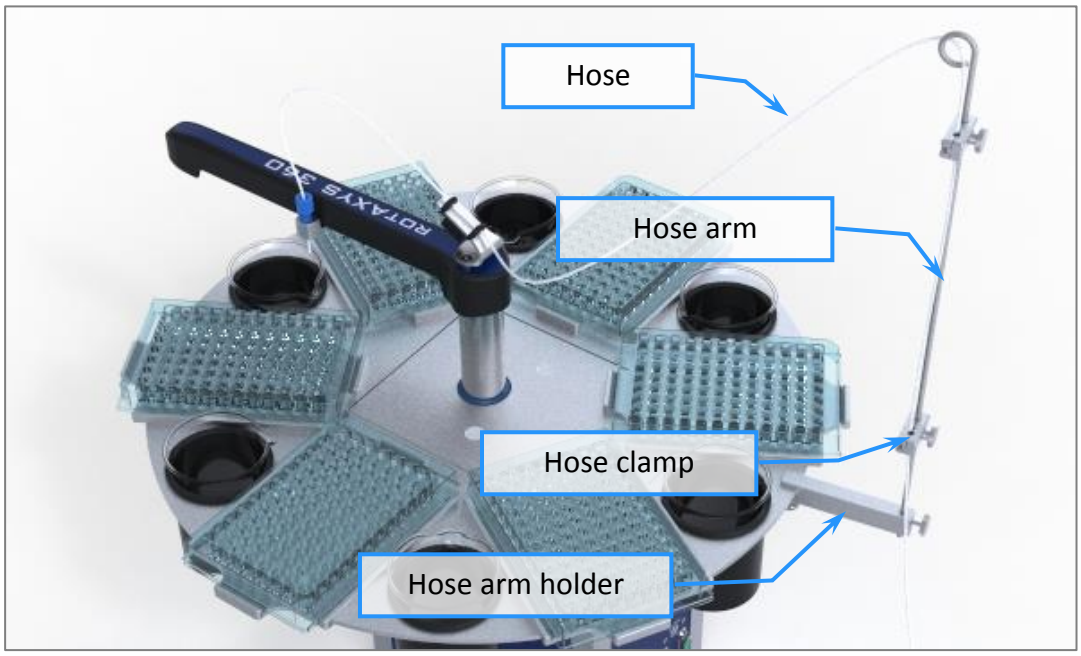


Figure 10 – Hose arm holder at the sample table

Attach the hose arm holder at a convenient location of the sample table using the knurled screw on the bottom. Fix the hose arm in position by tightening the upper knurled screw. Loosen this screw to adjust the height of the hose arm.

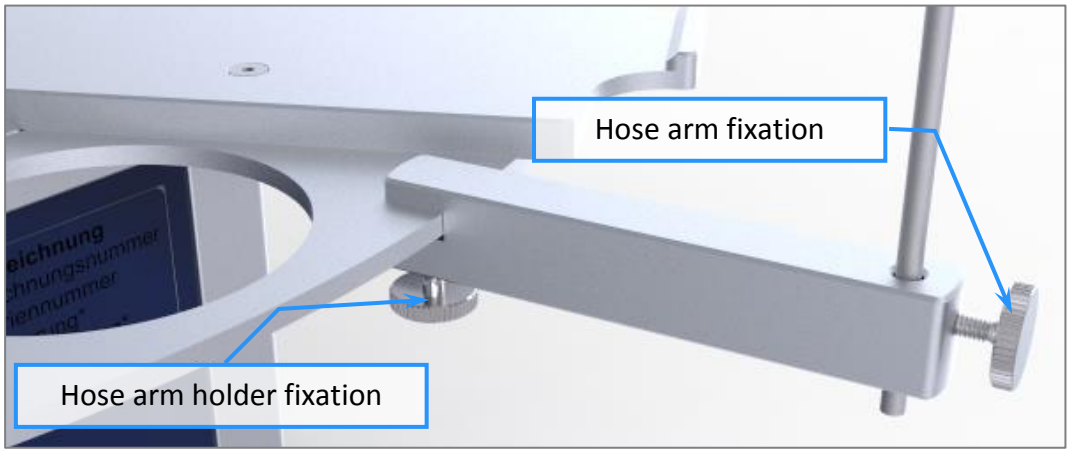


Figure 11 – Hose arm holder on sample table

IMPORTANT

Place the hose in such way as to avoid protrusion into the traversing range of the pivoting boom.

Two hose clamps have been supplied with the device. You can use these clamps to attach the hose to the hose holder and guide it upwards (see image below).

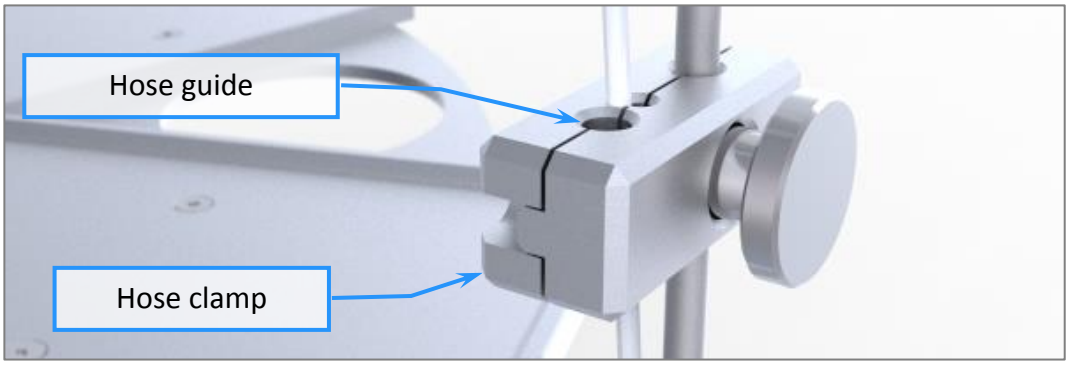


Figure 12 – Hose clamp at hose holder

Loosen the knurled screw of the hose guider. Place the hose in the correct hole and retighten the knurled screw. By tightening the screw the clamp and hose are locked in position on the holder.

Insert the hose into the lug at the upper end of the hose arm and guide it to the attachment point on the pivoting boom.

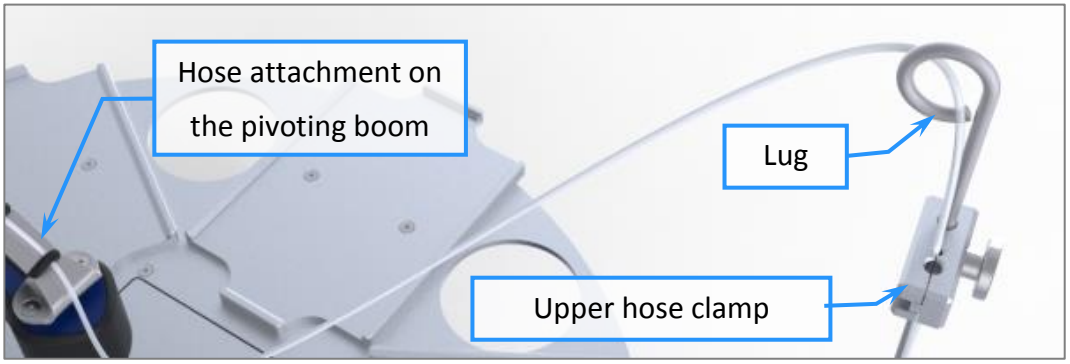


Figure 13 – Hose routing from hose arm to pivoting boom

IMPORTANT

The hose should be placed in such way that it doesn't cause tension on the hose arm anywhere in the vertical stroke range of the lifting axis or the turning range.

8. Maintenance and Care

8.1. Introduction

When used properly the device is maintenance-free. The manufacturer recommends sending the devices to cetoni GmbH for maintenance every two years. In cases of malfunction please contact cetoni GmbH.

IMPORTANT

If you send the device back to cetoni, please decontaminate it, if required, and add a completed contamination declaration to your shipment.

8.2. Troubleshooting

Should you encounter mechanical problems that you can't fix yourself or which require opening the device, please contact cetoni GmbH to discuss further actions. The device may only be opened by cetoni GmbH or authorized service staff. Violating this rule will void the warranty.

CAUTION

There is a risk of damaging electrical or mechanical components. Refrain from using the device if you become aware of any damage. Do not attempt to repair the device yourself. Instead let cetoni GmbH repair the device and return it to safe working order.

Malfunctions connected to the operating software are described in the software manual.

9. Disposal

Please send your old devices back to cetoni GmbH. We will take care of proper disposal pursuant to the relevant laws and regulations.

IMPORTANT

Before you send the device back to cetoni, please decontaminate it, if required, and add a completed contamination declaration to your shipment.